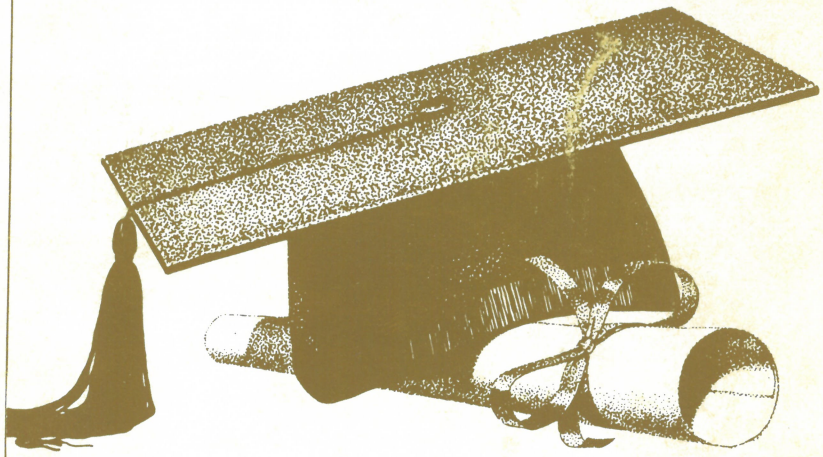
KRELL'S

ACT*

EXAM PREPARATION SERIES



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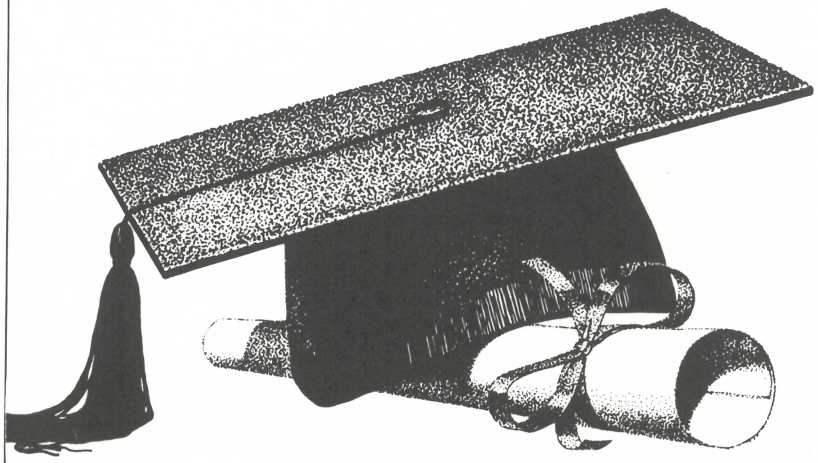

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TABLE OF CONTENTS

Aims 6

Structure of the ACT 7

Special Features 8

How to Use the Automatic Learning Feature (A.L.F.) 9

Loading Instructions 10

User Materials 12

Appendix 38

In Case of Difficulty 58

AIMS

★ We seek to provide a set of study tools and aids that enable students to improve their performance on ACT* Exams.

★ We intend to help enhance performance in a fundamental way: not merely by teaching the techniques which improve their skill at dealing with standardized examinations but by conveying a genuine mastery of the essential verbal and mathematical skills required.

★ We wish to establish for every student, including those whose classroom learning experiences may have been less than satisfactory, that sense of intellectual accomplishment and independence which accompanies the mastery of basic skills and is the foundation of academic performance.

★ We mean to provide to both teachers and students a systematic tool which offers complete and comprehensive practice in a truly individualized learning environment. We will match drill and practice to each student in accordance with his or her individual needs. This preparation package will, when desired, create an important degree of insulation from the often detrimental social pressure of the classroom. The infinite patience and tolerance of a computerized tutor will be of particular value in assisting underachievers.

STRUCTURE OF THE ACT

The ACT is composed of 4 principal parts:

1. English Usage and Grammar
2. Mathematics
3. Social Science Reading
4. Natural Science Reading

1. English Usage and Grammar

In order to measure your skill in verbal communication, the ACT will confront you with multiple choice questions that require you to specify how the underlined portion of a reading selection should be dealt with. In all cases, you will be offered 4 choices, the first of which is usually NO CHANGE. This is the answer you should select when you believe that the underlined portion is correct. Each of the 3 other alternatives is used to indicate that one or more modifications are required to make this sentence clear and grammatically correct.

The essential skill required for a high level of performance on this portion of the ACT is your ability to accurately diagnose the most important and frequently encountered mistakes in English usage and grammar. To sharpen your skill at recognizing and remedying these mistakes, Krell's ACT package includes the Grammar, What Big Teeth You Have! program series. This series provides comprehensive instructions in grammar and usage along with a virtually limitless series of diagnostic practice programs. These programs allow you to focus upon the areas of the ACT grammar and English usage sections where you need help most.

2. Mathematics

The topics covered by the ACT include Arithmetic, Algebra, and Geometry. The difficulty level of the mathematics questions varies widely and will always include a broad range of subject matter including word problems, number theory, scientific notation, etc. This package contains a comprehensive series of math programs offering problems and detailed explanations in all mathematical skills found in the ACT.

3. & 4. Natural Science and Social Science Reading.

The Natural and Social Science Reading portions of the ACT exams are similar in structure and consist of a number of reading selections. Following each selection, you will be asked questions to determine how well you understand the material presented and how well you are able to apply the material to specific situations.

In addition, both the Natural and Social Science reading sections of the A C T usually contain approximately a dozen questions where reading material is presented. In answering these questions, you will be asked to draw upon your general knowledge of the subject area. In order to help you prepare for these questions, Krell has included a wide ranging series of true-false problems covering the appropriate areas of Natural and Social Science. Please note, these questions have not been designed to duplicate the problems you will encounter on any specific future ACT, however they will guide your study by indicating the particular areas of knowledge in which you will be examined.

The ACT exam confronts you with many questions that require you to read selections and respond to questions regarding that material. The reading selections will vary in subject matter and complexity. In each case, however, examiners are concerned primarily with your ability to accurately read and understand the printed selections.

You will be faced with questions that call upon you to make logical inferences from the material. You may be asked to display your understanding in a variety of ways such as:

1. Selecting a suitably descriptive title for the entire selection.
2. Indicating whether or not the author would be likely to agree or disagree with particular statements.
3. Indicating the author's purpose in writing the material.
4. Applying the ideas in the reading selection to a new situation.

There is no magic or easy way to prepare for reading questions. Invariably, these questions call upon your skill to read accurately, the breadth of your vocabulary, and your mastery of the underlying logic of English grammar and syntax. Recognizing the practical limitations on offering a cram course in those skills that have taken you a lifetime to develop, we offer you practice questions that are designed to:

1. Familiarize you with the kinds of questions posed by examiners so that you can recognize the logical patterns of inference that the examiner wishes to test.
2. Stress the utmost importance of reaading with precision. This applies both to the reading selections and to the questions that are posed.

5. ACT Test-Taking Strategy

Since the ACT scoring system does not penalize you for wrong answers, you should answer all questions. Obviously, where you can eliminate certain multiple choice alternatives, the likelihood of a correct guess will improve. Although it may seem unnecessary to remind you - always remember that you can lose points by failing to answer the questions exactly as they are posed. Carefully read and re-read each question to make certain that you are providing the information requested rather than information which you know but which is not the information requested.

SPECIAL FEATURES

SELF-CUSTOMIZING LOGIC

SCL, Krell's unique Self-Customizing Logic, tailors learning to the needs and progress of each student. SCL automatically analyzes a student's skills and instantly modifies and personalizes instructions. SCL eliminates tedious repetition because the machine determines what you already know. Learning is then concentrated on the topics most important to each student.

SCL analyzes individual student performance in great detail and matches instruction and practice materials to individual needs with greater precision than is possible in any ordinary classroom situation. SCL works so well that Krell offers a performance increase warranty on its SAT* and ACT* exam preparation series.

When this option is exercised, the program analyzes the student's performance on an ongoing basis and alters the way in which problems are selected for presentation. Using this technique, the program automatically generates more of the kinds of problems that the student consistently answers incorrectly.

The coefficients which control the likelihood of certain problems appearing are saved on disk for future use.

CHARGE FOR USE

This product may not be used by an owner who charges a fee for others to use the product on his or her computer. This applies to schools that charge students a fee, in addition to, or as, tuition to use this product. The product may not be given or loaned to a student to use on his or her own computer.

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KRELL'S DISK REPLACEMENT AND BACKUP POLICY

The enclosed diskette(s) are protected against unauthorized duplication. In the event that a disk is destroyed as the result of some unforeseen disaster, Krell Software Corporation will provide a replacement for $10.00. Please be sure to include the serial number as a replacement will only be furnished to the original purchaser. Krell does not provide multiple backups for each disk.

HOW TO USE THE AUTOMATIC LEARNING FEATURE (A.L.F.)

The A.L.F. provides a sequence of prompt questions that you must answer.

DO YOU WISH TO USE THE AUTOMATIC LEARNING FEATURE (Y or N) ?

Press Y if you want to use A.L.F.

DO YOU WISH TO USE YOUR PREVIOUS LEARNING COEFFICIENTS (Y or N)?

NOTE: You MUST press N if this is the first time that you are using the A.L.F.

PLEASE TYPE THE NAME OF YOUR FILE.

You must type a file name that begins with a letter.

NOTE: You can only recall a file if it has been previously saved.

NOTE: You should write the file name and program name down on paper because you will not be able to catalog the disk and reload a learning coefficient file if one is not saved for a given program.

If you have any questions, call KRELL at (516) 751-5139
Monday through Friday 10 a.m. to 4 p.m. E.S.T.

LOADING INSTRUCTIONS

If you have any questions, call Krell at (516) 751-5139
Monday through Friday 10:00 A.M. to 4:00 P.M.

ACORN:

Booting the disks: Hold shift key down. Press break key for 0.5 second, release. Release shift key.

APPLE II+:

Place the disk in Drive 1 and boot.

ATARI:

Programs require 48K memory

BOOTING THE DISKS: Insert basic cartridge into computer. Turn on drive 1. Insert disk in drive. Turn on ATARI 800/800XL/1200XL. After a few moments, READY will appear on the screen. Let boot process continue until program menu appears.

C-64:

LOADING INSTRUCTIONS
Place the disk in Drive 0 and type:
LOAD "MENU", 8,1
RUN <RETURN>

IBM:

IBM PC

Place your DOS (1.1 or 2.0) Disk in drive A: and the Krell disk in drive B: Typing B: INSTALL will install your Krell disk. To run the KRELL disk, place it in drive A: and reboot the system or type AUTOEXEC.

IBM PC SINGLE DRIVE SYSTEMS

Follow the above instructions. The A:disk is your DOS disk and the B:disk is the Krell disk.

IBM PC XT

Place the Krell disk in the floppy disk drive and type A:INSTALLH. READ THE ON-SCREEN INSTRUCTIONS CAREFULLY! To run the Krell disk with the hard drive as the default drive, type KRELL.

LOOK—ALIKES

For machines supplied with GWBASIC.EXE instead of BASIC COM, follow the instructions for IBM PC, but type INSTALLG. To run on this system, you will have to put the Krell disk in drive A: and a disk with GWBASIC. EXE in drive B:.

CP/M

If you find a file named INSTALL. COM, run this file. You will need to know the following codes (in sec. 1) for your terminal:

Cursor positioning (x,y)
Clear to end of line
Clear to end of screen
Home and Clear screen

Then run SYSGEN (or your program to copy the system tracks to the Krell disk.)
If you do not find INSTALL. COM on your disks, the Krell programs have already been installed for your system.
To run the KRELL disk, type MENU.

PET:

Place the disk in Drive 0 and type:

LOAD "MENU", 8
RUN < return>

TRS—80 MODEL III:

Place the disk of your choice in Drive 0 and hit the RESET button.

USER MATERIALS

This section contains additional materials to which users of the Krell's ACT* Preparation Series are referred by the computer programs. Included are diagrams referred to in certain of the mathematics programs and the 22 reading selections to which the reading comprehension programs relate.

PASSAGE 1

Mill rightly points out that in the United States, under the condition of direct election, the chosen President "is almost always an obscure man, or one who has gained any reputation he may possess in some other field than politics." In any case it is clear that, where expert service and guidance are needed, the public has neither the knowledge nor the opportunity to discover it. A great deal has been said and written regarding the need for experts in the increasingly complex and comprehensive business of the state; and it is a common charge against democracy that it suffers its affairs to be badly administered because it is ignorant of, and indifferent to, the requirements of good administration. The direct formal responsibility avails if the executive is responsible only to the inexpert and heterogeneous public.

PASSAGE 2

Listen, then, he said; I proclaim that justice is nothing else than the interest of the stronger. And now why do you not praise me? But, of course, you won't.

Let me first understand you, I replied. Justice, as you say, is the interest of the stronger. What, Thrasymachus, is the meaning of this? You cannot mean to say that because Polydamas, the pancratiast, is stronger than we are, and finds the eating of beef conducive to his bodily strength, that to eat beef is therefore equally for our good who are weaker than he is, and right and just for us?

That's abominable of you, Socrates; you take the words in the sense which is most damaging to the argument.

Not at all my good sir, I said; I am trying to understand them; and I wish that you would be a little clearer.

Well, he said, have you never heard that forms of government differ; there are tyrannies, and there are democracies, and there are aristocracies?

Yes, I know.

And the government is the ruling power in each state?

Certainly.

And the different forms of government make laws democratical, aristocratical, tyrannical, with a view to their several interests; and these laws, which are made by them for their own interest, are the justice which they deliver to their subjects, and him who transgresses them they punish as a breaker of the law, and unjust. And that is what I mean when I say that in all states there is the same principle of justice, which is the interest of the government; and as the government must be supposed to have power, the only reasonable conclusion is, that everywhere there is one principle of justice which is the interest of the stronger.

PASSAGE 3

Democracy is much broader than a special political form, a method of conducting government, of making laws and carrying on governmental administration by means of popular suffrage and elected officers. It is that, of course. But it is something broader and deeper than that. The political and governmental phase of democracy is a means, the best means so far found, for realizing ends that lie in the wide domain of human relationships and the development of human personality. It is, as we often say, though perhaps without appreciating all that is involved in the saying, a way of life, social and individual. The keynote of democracy is the necessity for the participation of every mature human being in formation of the values that regulate the living of men together, which is necessary from the standpoint of both the general social welfare and the full development of human beings as individuals.

Universal suffrage, recurring elections, responsibility of those who are in political power to the voters, and the other factors of democratic government are means that have been found expedient for realizing democracy as the truly human way of living. They are not a final end and a final value. They are to be judged on the basis of their contribution to end. It is a form of idolatry to erect means into the end which they serve. Democratic political forms are simply the best means that human wit has devised up to a special time in history. But they rest upon the idea that no man or limited set of men is wise enough or good enough to rule others without their consent; the positive meaning of this statement is that all those who are affected by social institutions must have a share in producing and managing them. The two facts that each one is influenced in what he does and enjoys and in what he becomes by the institutions under which he lives, and that therefore he shall have, in a democracy, a voice in shaping them, are the passive and active sides of the same fact.

PASSAGE 4

There is no more an inherent sanctity in a church, trade-union, business corporation, or family institution than there is in the state. Their value is also to be measured by their consequences. The consequences vary with concrete conditions; hence at one time and place a large measure of state activity may be indicated and at another time a policy of laissez-faire. Just as publics and states vary with conditions of time and place, so do the concrete functions which should be carried on by the states. There is no antecedent universal proposition which can be laid down because of which the functions of a state should be limited or should be expanded. Their scope is something to be critically and experimentally determined.

PASSAGE 5

But the dictatorship of the proletariat—i.e., the organization of the vanguard of the oppressed as the ruling class for the purpose of crushing the oppressors—cannot produce merely an expansion of democracy. Together with an immense expansion of democracy which for the first time becomes democracy for the poor, democracy for the people, and not democracy for the rich folk, the dictatorship of the proletariat produces a series of restrictions of liberty in the case of the oppressors, the exploiters, the capitalists. We must crush them in order to free humanity from wage-slavery: their resistance must be broken by force; it is clear that where there is suppression there is also violence, there is no liberty, no democracy...

PASSAGE 6

We have touched lightly and in passing upon the conditions which must be fulfilled if the Great Society is to become a Great Community; a society in which the ever-expanding and intricately ramifying consequences of associated activities shall be known in the full sense of that word, so that an organized, articulate Public comes into being. The highest and most difficult kind of inquiry and a subtle, delicate, vivid and responsive art of communication must take possession of the physical machinery of transmission and circulation and breathe life into it. When the machine age has thus perfected its machinery, it will be a means of life and not its despotic master. Democracy will come into its own, for democracy is a name for life of free and enriching communion. It has its seer in Walt Whitman. It will have its consummation when free social inquiry is indissolubly wedded to the art of full and moving communication.

PASSAGE 7

From this view of the subject, it may be concluded that a pure democracy, by which I mean a society consisting of a small number of citizens who assemble and administer the government in person, can admit of no cure for the mischiefs of faction. A common passion or interest will, in almost every case, be felt by a majority of the whole; a communication and concert result from the form of government itself; and there is nothing to check the inducements to sacrifice the weaker party or an obnoxious individual. Hence, it is that such democracies have been spectacles of turbulence and contention; have ever in general, been as short in their lives as they have been violent in their deaths. Theoretic politicians who have patronized this species of government have erroneously supposed that by reducing mankind to a perfect equality in their political rights, they would at the same time be perfectly equalized and assimilated in their possessions, their opinions, and their passions.

A republic, by which I mean a government in which the scheme of representation takes place, opens a different prospect and promises the cure for which we are seeking.

PASSAGE 8

The fact that bureaucratic organization is technically the most highly developed means of power in the hands of the man who controls it does not determine the power that bureaucracy as such is capable of having in such a social structure. The ever-increasing "indispensability" of the officialdom, swollen to millions, is no more decisive for this question than is the view of some representatives of the proletarian movement that the economic indispensability of the proletarians is decisive for the measure of their social and political power position. If "indispensability" were decisive, then where slave labor prevailed and where freemen usually detest work as a dishonor, the "indispensable" slaves ought to have occupied the positions of power, for they were at least as indispensable as officials and proletarians are today. Whether the power of bureaucracy as such increases cannot be decided a priori from such reasons. The drawing in of economic interest groups or other non-official experts, or the drawing in of non-expert lay representatives, the establishment of local, inter-local, or central parliamentary or other representative bodies, or of occupational associations - these seem to run contrary to the bureaucratic tendency.

PASSAGE 9

Let us now try to clarify the points at which the Puritan idea of the calling and the premium it put upon ascetic conduct was bound to directly influence the development of a capitalistic way of life. As we have seen, this asceticism turned with all its force against one thing; the spontaneous enjoyment of life and all it had to offer. This is perhaps most characteristically brought out in the struggle over the Book of Sports which James I and Charles I made into law expressly as a means of counteracting Puritanism, and which the latter ordered to be read from all the pulpits. The fanatical opposition of the Puritans to the ordinances of the King, permitting certain popular amusements on Sunday outside of Church hours by law, was explained not only by the disturbance of the Sabbath rest, but also by resentment against the intentional diversion from the ordered life of the saint, which it caused. And, on his side, the King's threat of severe punishment for every attack on the legality of those sports was motivated by his intention to break the anti-authoritarian ascetic of Puritanism, which was so dangerous to the State. The feudal and monarchical forces protected the pleasure seekers against the rising middle-class morality and the anti-authoritarian ascetic conventicles, just as today capitalistic society tends to protect those willing to work against the class morality of the proletariat and the anti-authoritarian trade union.

As against this, the Puritans maintained their decisive characteristic, the principle of ascetic conduct. For otherwise, the Puritan aversion to sport, even for the Quakers, was by no means simply one of principle. Sport was accepted if it served a rational purpose, that of recreation necessary for physical efficiency. But as a means for the spontaneous expression of undisciplined impulses, it was under suspicion; and insofar as it became purely a means of enjoyment, or awakened pride, raw instincts or the irrational gambling instinct, it was of course strictly condemned. Impulsive enjoyment of life, which leads away from work in a calling or from religion, was as such the enemy of rational asceticism, whether in the form of seigneurial sports, or the enjoyment of the dance-hall or the public-house of the common man.

PASSAGE 10

Like other tyrannies, the tyranny of the majority was at first, and still is vulgarly, held in dread, chiefly as operating through the acts of the public authorities. But reflecting persons perceived that when society is itself the tyrant — society collectively over the separate individuals who compose it — its means of tyrannizing are not restricted to the acts which it may do by the hands of its political functionaries. Society can and does execute its own mandates: and if it issues wrong mandates instead of right, or any mandates at all in things in which it ought not to meddle, it practices a social tyranny more formidable than many kinds of political oppression, since, though not usually upheld by such extreme penalties, it leaves fewer means of escape, penetrating much more deeply into the details of life, and enslaving the soul itself. Protection, therefore, against the tyranny of the magistrate is not enough: there needs protection also against the tyranny of the prevailing opinion and feeling; against the tendency of society to impose, by other means than civil penalties, its own ideas and practices as rules of conduct on those who dissent from them; to fetter the development, and if possible, prevent the formation, of any individuality not in harmony with its ways, and compel all characters to fashion themselves upon the model of its own. There is a limit to the legitimate interference of collective opinion with individual independence: and to find that limit, and maintain it against encroachment, is as indispensable to a good condition of human affairs, as protection against political despotism.

The object of this Essay is to assert one very simple principle. That principle is, that the sole end for which mankind was warranted, individually or collectively, in interfering with the liberty of action of any of their number, is self-protection. That the only purpose for which power can be rightfully exercised over any member of a civilized community, against his will, is to prevent harm to others. His own good, either physical or moral, is not a sufficient warrant. He cannot rightfully be compelled to do or forbear because it will be better for him to do so, because it will make him happier, because, in the opinions of others, to do so would be wise, or even right. These are good reasons for remonstrating with him, or reasoning with him, or persuading him, or entreating him, but not for compelling him, or visiting him with any evil in case he do otherwise. To justify that, the conduct from which it is desired to deter him must be calculated to produce evil to some one else. The only part of the conduct of any one, for which he is amenable to society, is that which concerns others. In the part which merely concerns himself, his independence is, of right, absolute. Over himself, over his own body and mind, the individual is sovereign.

PASSAGE 11

Education, many people say, is still mainly governed by the ideas of men like Plato, who lived when the warrior caste and the priestly or philosophical class were alone in honor, and the really useful part of the community were slaves. It is an education fitted for persons of leisure, in such a community. This education passed from Greece and Rome to the feudal communities of Europe, where also the warrior caste and the priestly caste were alone held in honor, and where the really useful and working part of the community, though not nominally slaves as in the pagan world, were practically not much better off than slaves, and not more seriously regarded. And how absurd it is, people end by saying, to inflict this education upon an industrious modern community, where very few indeed are persons of leisure, and the mass to be considered has not leisure, but is bound, for its own great good, and the great good of the world at large, to plain labor and to industrial pursuits, and the education in question tends necessarily to make men dissatisfied with these pursuits and unfitted for them!

That is what is said. So far I must defend Plato, as to plead that his view of education and studies is in the general, as it seems to me, sound enough, and fitted for all sorts and conditions of men, whatever their pursuits may be. "An intelligent man," Plato said, "will prize those studies which result in his soul getting soberness, righteousness, and wisdom, and will less value the others." I cannot consider that a bad description of the aim of education, and of the motives which would govern us in the choice of studies, whether we are preparing ourselves for a hereditary seat in the English House of Lords or for the pork trade in Chicago.

Still I admit that Plato's world was not ours, that his scorn of trade and handicraft is fantastic, that he had no conception of a great industrial community such as that of the United States, and that such a community must and will shape its education to suit its own needs. If the usual education handed down to it from the past does not suit it, it will certainly before long drop this and try another. The usual education in the past has been mainly literary. The question is whether the studies which were long supposed to be the best for all of us are practically the best now; whether others are not better. The tyranny of the past, many think, weighs on us injuriously in the predominance given to letters in education. The question is raised whether, to meet the needs of our modern life, the predominance ought not now to pass from letters to science; and naturally the question is nowhere raised with more energy than here in the United States. The design of abasing what is called "mere literary instruction and education," and of exalting what is called "sound, extensive, and practical scientific knowledge," is, in this intensively modern world of the United States, even more perhaps than in Europe, a very popular design, and makes great and rapid progress.

PASSAGE 12

This division of labour, from which so many advantages are derived, is not originally the effect of any human wisdom, which forsees and intends that general opulence to which it gives occasion. It is the necessary, though very slow and gradual consequence of a certain propensity in human nature which has in view no such extensive utility, the propensity to truck, barter, and exchange one thing for another.

Whether this propensity be one of those original principles in human nature, of which no further account can be given; or whether, as seems more probable, it belongs not to our present subject to enquire. It is common to all men, and to be found in no other race.

Man has almost constant occasion for the help of his brethren, and it is in vain for him to expect it from their benevolence only. He will be more likely to prevail if he can interest their self-love in his favour, and show them that it is for their own advantage to do for him what he requires of them. Whoever offers to another a bargain of any kind, proposes to do this. Give me that which I want, and you shall have this which you want, is the meaning of every such offer; and it is in this manner that we obtain from one another the far greater part of the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages.

PASSAGE 13

How can the independence of human volition be harmonized with the fact that we are integral parts of the universe which is subject to the rigid order of nature's laws?

At first sight these two aspects of human existence seem to be logically irreconcilable. On the one hand, we have the fact that natural phenomena invariably occur according to the rigid sequence of cause and effect. This is an indispensable postulate of all scientific research, not merely, in the case of those sciences that deal with the physical aspects of nature, but also in the case of the mental sciences, such as psychology. Moreover, the assumption of an unfailing causal sequence in all happenings is the basis on which our conduct of everyday life is regulated. But, on the other hand, we have our most direct and intimate source of knowledge, which is the human consciousness, telling us that in the last resort our thought and volition are not subject to this causal order. The inner voice of consciousness assures us that at any given moment we are capable of willing this or that alternative. And the corollary of this is that the human being is generally held responsible for his own actions. It is on this assumption that the ethical dignity of man is based.

How can we reconcile that dignity with the principle of causation? Each one of us is an integral part of the world in which we live. If every other event in the universe be a link in the causal chain, which we call the order of nature, how can the act of human volition be looked upon as independent of that order? The principle of causation is either universally applicable or it is not. If not, where do we draw the line, and why should one part of creation be subject to a law that of its nature seems universal, and another part be exempted from that law?

PASSAGE 14

The path to modernization takes a variety of forms in different cultures and seems likely to continue. Depsite these many forms, we can make an important generalization: sociologically, modernization is accompanied by a multiplication of roles. A wider variety of roles come into existence in accordance with changes in patterns of production, distribution and organization. Technically, experts with narrow ranges of specialization begin to replace those in traditional positions of authority. There seems to be an evolution in sociological terms from a society where power is controlled by elders and priests toward a society in which there is a very complex interdependency and sharing of authority among managers and experts of all sorts. One important aspect of this shift has been the gradually decreasing role of hereditary wealth and ownership toward a situation in which individuals have the opportunity to translate their talents into money and power in a multitude of different ways.

Although specialization has multiplied our collective capacity to produce and has refined and extended the capacity of political leaders to control, it has also resulted in some potentially pathological tendencies. For example, with specialization, the entire process of education becomes fragmented. No longer does the educational process serve to integrate society's young, but rather to separate them and to detract from their sense of social identification with one another.

Advances in communication and transportation technology have been built on the same specialization that reduces the subjects about which people can communicate and these social bonds they travel to maintain. The problem is complicated further by the pressures that force each individual to play a multiplicity of roles. Consider, if you will, the situation of individuals who must constantly shift between roles of parent, wage earner, household manager, chauffeur, citizen, etc., during the course of the day.

PASSAGE 15

My most recent study of creativity utilizes measures derived in three principal ways. First, we have indices of creativity for individuals that are based upon the assessments of their colleagues and peers. Second, those individuals near the upper and the lower ends of the creativity spectrum were interviewed, and their attitudes regarding themselves and a wide variety of topics were recorded. Third, participants in the study were given several complex problem-solving tasks to perform. The overall results obtained were as follows:

1. Those rated more creative displayed less anxiety than the less creative.
2. On tests of verbal intelligence, the performance of the two groups was approximately equal.
3. The more creative group held less authoritarian attitudes and was less supportive of existing political and religious institutions.
4. The more creative group regards themselves as being more "different" from ordinary people than does the less creative group.
5. The more creative group was more concerned with practical as opposed to mystical or moral considerations than was the less creative group.
6. The more creative group was more willing to take initiative and more willing to accept personal responsibility for failure than the less creative group was.
7. In approaching problems, members of the creative group spend relatively more time analyzing situations and relatively less time synthesizing answers.

PASSAGE 16

"In football," said Vince Lombardi, "winning isn't everything, it's the only thing!" In the study of voting, however, winning is just one among many considerations. Political scientists and other students of the American electoral process have approached the study of American voting behavior in ways that reflect the underlying nature of their own concern.

Those whose interest is principally scientific and whose methods are essentially statistical, together with those for whom the development of a strategy aimed at solving the very practical problem of winning elections, constitute the largest group. In the main, they have sought to discover causal patterns of relationships among the ethnic, regional, economic, educational and other demographic and attitudinal variables presumed to influence the voting decisions of individuals. By analyzing aggregate historical data, voting patterns, and survey data on the individual level, these researchers have attempted to discover relationships that are useful in the explanatory and strategic sense.

A second group has focused primarily on the impact of the underlying legal, sociological and institutional factors that shape electoral politics. Attitude formation, exposure to political communication, patterns of registration and turnout, party organization, and the geographic nature of electoral districts are all major concerns of these researchers. Their goals have also been explanatory and strategic, but the scope of their interest has tended to be somewhat wider in both the scientific and political sense. Their search for patterns of causation tends to cover earlier stages in the voting process that shape the nature of political participation and the rules that govern how that participation produces specific electoral outcomes. Unlike the first group, many of these researchers overtly concern themselves with reform. The issue of equality, not just prediction, plays a prominent role in many of their writings.

A far smaller, yet intellectually more subtle, group oriented its study of the electoral process toward examining its impact on the nature of the political and governmental process as a whole. Their concern with elections has not been merely with who wins, but rather with how the entire electoral process shapes the policies that are adopted and the nature of individual participation in political life. To their credit, these researchers have helped make us aware of the ways in which the electoral process, irrespective of the specific winners chosen, plays a crucial role in our political life. The details of the campaign process, the activities by which alliances are formed and political business conducted, the rules and limits of competition and controversy, the kinds of promises and commitments that are made by candidates, the selection of audiences to whom these commitments are made and the extent to which they limit future action, the very nature of political discourse and the future agenda for public action—in short, how we perceive what "problems" exist, the omnipresent ritual of losers pledging their cooperation with, and support for, winners—all are essential ingredients in the ongoing process of political socialization and education that reinforce the mutual trust upon which our political life as a nation is founded.

PASSAGE 17

Here are the opinions of five individuals regarding the issue of abortion.

A. Abortion is wrong in any situation. It violates God's Laws. We should use every means at our disposal to prevent abortion.

B. I personally oppose abortion and would never have one myself. However, I believe that it must be a matter of personal choice for each woman.

C. I do not think my personal feelings matter. The Supreme Court has ruled that abortion is legal in many circumstances and everyone should accept that as the law of the land.

D. Despite the fact that the Supreme Court has legalized abortion which is permissible now only under certain circumstances, the psychological trauma for the woman and the others involved is so great that we must try by lobbying, electoral politics, and non-violent demonstrations to get the Supreme Court to modify its stand.

E. The abortion issue is a source of hostility between groups in our society that we must solve once and for all. The real issue is to eliminate this source of conflict from our political life. After all, whether legal or illegal, abortion is bound to continue. And, no matter how the problem is solved, people will continue to use abortion and even infanticide to avoid unwanted babies.

PASSAGE 18

A country's balance of payments is a record of all economic transactions between citizens, firms and the government of one country and citizens, firms and the government of another country or countries during a given period of time. This accounting system serves a number of purposes. It provides the government with data indicating the international position of the country as an aid in reaching decisions on monetary and fiscal policy and in regulating trade and international payments.

In addition to promoting data for policy decisions at the Federal or Central Government level, balance of payments data serves many other informational purposes and is an important consideration in private investment decisions and in placing orders for "foreign" goods.

The mechanics of balance of payments accounting is straightforward. In essence, the balance of payments is a standard, double entry bookkeeping procedure in which all international transactions originating in a country will generate a credit and a debit entry of equal size.

It is important to remember that an increase in claims on foreigners or a reduction in liabilities to foreigners is a capital outflow and is a debit in the balance of payments; a decrease in claims on foreigners or an increase in liabilities to foreigners is a capital inflow and is a credit in the balance of payments.

It seems strange that a capital outflow is treated as a debit in the balance of payments when it makes the country a creditor. Such is the case: an inflow is a credit, and a capital outflow a debit.

This may be easier to understand if we consider the direction of payments. An export of capital generates a payment to a foreign citizen, firm or government in much the same manner as an import of merchandise. Both transactions are debits. A capital inflow means that payments are being made to the reporting country as would be the case with an export of goods.

Consider the following transactions: an export of $1 million worth of goods from the United States against a Belgian firm's account in New York; the other an American firm's import of $1 million in goods from a Belgian exporter, which is settled by a payment into the U.S. firm's account in New York. In the first transaction, the reduction in the Belgian account in New York is a decrease in American liabilities to foreigners or a capital outflow or a debit. The increase in the Belgian's account in New York in the second transaction is an increase in American liabilities to foreigners or a capital inflow or credit.

Differences in timing between international transactions and the record of these transactions have great significance when the speculative view of a currency changes. If a currency is likely to be devalued, imports into that country will be accelerated, so that stocks can be increased before the cost of the goods increases, on the other hand, exporters will hold shipments back in the hope of getting higher prices in local currency for the foreign exchange earned by their foreign sales.

PASSAGE 19

For many centuries, scientists attempted to create a model that accurately described the shape of the planet. It wasn't until recent times that they were able to gather the indirect and direct evidence necessary to create this model.

Pre-twentieth century observers noted that a ship's tall mast would disappear gradually below the horizon as the ship sailed towards the horizon. They concluded that this "disappearance" was due to the curved surface of the earth. Other observers concluded that because the sun and moon had a spherical shape, that the earth, too, must be sperical. During the sixteenth century, after significant circumnavigations, sailors concluded that the earth must be round.

Modern scientists have been more fortunate. With the aid of sophisticated instruments, airplanes and satellites, they have been able to gather the kind of direct evidence needed to determine the actual shape of the earth. This evidence includes gravitational data which depends upon the distance from the earth's center of gravity. Readings taken at various locations worldwide are approximately equal, indicating that points on the earth's surface are approximately equidistant from the center of the earth. Other direct evidence includes photographs of the earth's curvature taken from aircraft and satellites high above the earth's surface.

One last significant piece of evidence includes observations of the North Star. In the northern hemisphere, an observer will always observe the altitude of Polaris at a number of degrees above the horizon equal to the observer's latitude in degrees above the equator. This relationship can only occur on a spherical object.

PASSAGE 20

There is an extensive body of evidence indicating that auxins, or plant growth hormones, regulate various plant activities and may promote or inhibit various cellular functions. These auxins move about the cell by means of the plant's transport system, or by cell-to-cell transfer.

Much of our evidence indicates that auxins enable plants to respond to various external stimuli. They may also account for variations in the growth of plants. Responses to such stimuli are called tropisms. They result in growth towards or away from the stimulus.

Hydrotropism is the response of a plant to water. Plant roots normally grow toward water. However, research indicates that this tendency may be related to the search for dissolved oxygen in the water, since oxygen has a higher concentration in water than in soil. Root tissue samples indicate the presence of auxins. Hydrotropism is not as well-defined or well-exhibited compared to other tropisms.

Phototropism is the response of plants to light. Auxins accumulate on the shaded side of plant bodies, causing the plant to grow more rapidly. Since the plant grows toward the light, this is called a positive tropism.

Geotropism is the response of plants to the force of gravity. Plant roots tend to grow downward, toward the earth's center. Plant stems, however, tend to grow upward against the force of gravity. Roots in a horizontal position tend to have an accumulation of auxins in the lower part, causing the upper part to grow more rapidly.

Another form of tropism is thigmotropism. This is the response of plants to physical contact. Plants encounter various objects during their growth. Beans, grapes and ivy tend to twine about objects they encounter during their growth. Growth is greater on the side of the plant opposite the point of contact causing the plant to encircle the object, thus providing support for the plant's own growth.

PASSAGE 21

It has been approximately 300 years since Isaac Newton developed his three laws on the relationship between force and motion. These laws are central to our basic understanding of dynamics.

Newton's First Law of Motion, usually called the "law of inertia," states that a body will remain in a state of equilibrium as long as all forces acting upon that body remain in balance. Simply stated, an object at rest will remain at rest unless acted upon by an unbalanced force (measured in units called newtons, abbr. nts) or, if it is in motion, it will continue to maintain a uniform velocity in a straight line, until acted upon by an unbalanced force. As a result, any unbalanced force produces a change in velocity, or an acceleration. This can be produced by changing the object's velocity, direction, or both.

Newton's Second Law of Motion states that if an unblanced force acts upon a body, the object will be accelerated in the direction in which the force is acting. In simple terms, the larger the force acting upon a body, the greater the acceleration. Also, a given force will produce a lesser acceleration on a very massive object than on one having less mass. Using the example of a wheelbarrow, the same force will give more acceleration if it is empty and less acceleration if it is fully loaded. Therefore, acceleration is inversely proportional to mass (measured in kilograms, abbr. kgs) if the force remains constant. Newton expressed this in a formula: Force = Mass × Acceleration.

Newton's Third Law of Motion states that for every action there is an equal and opposite reaction. To clarify this statement, forces do not exist singly in nature. When one force is exerted, an equal force in the opposite direction must be exerted. For example, a book might exert a force of 4 nts on a desk top. If the book remains stationary, the table must be exerting a 4 nt force upon the book, for if one force were to exceed its opposite, motion would occur.

PASSAGE 22

Scientific models are statements which agree with observed fact, and which seek to explain those facts in a reasonable fashion. Whether the model is called an hypothesis, a theory, or a law, it is considered to be valid only as long as new, acceptable, experimental observations can be explained by it. If the model is unable to accomplish this objective, it must be refined, restated, or rejected.

One of Man's earliest discoveries was that of fire and of its uses. Several models have been devised to explain the phenomenon of combustion. During the mid-17th century, Georg Ernst-Stahl, under the guidance of his teacher, Johann Joachim Becher, developed a theory to explain how burning occurred. That theory was very different from our current theory of combustion. It was, however, one of the first great generalizations in the field of Chemistry.

To Stahl, burning a candle seemed to provide evidence that some unknown element was leaving the candle through the wick and through the flame. Certainly, less material remained after the candle was consumed as compared with the candle before it was ignited. Stahl called the mysterious element which escaped "phlogiston" or "fire material." Stahl contended that a substance, such as wood or charcoal, which burned readily and left little ash contained a great quantity of phlogiston. In contrast, substances such as iron or copper contained relatively minute quantities of the mysterious material because they did not burn easily.

The alchemists already knew that lead could be turned into a yellow powder by heating it in an iron crucible. This "lead ash," Stahl reasoned, was lead metal with the phlogiston removed. He concluded that lead ash was a simpler form of matter than lead metal itself. Also, he was convinced that if the phlogiston from another substance, say charcoal, could be recombined with lead ash, lead metal would be reconstituted. Experimentation confirmed Stahl's conclusion. Stahl's theory, which is diametrically opposed to current chemical concepts, passed the 'acid test' of its time, and for over 100 years many of the finest scientific minds accepted the Becher-Stahl theory.

In the late 1700's, however, Antoine Lavoisier, who has been dubbed "The Father of Modern Chemistry," experimented with dephlogisticated mercury. He learned that what we now call mercury (II) oxide was, when heated, separated into metallic mercury and a gas he named "oxygen". The dephlogisticated mercury was indeed more complex, not less complex, than mercury itself!

As a result of Lavoisier's work, we now believe that combustion results from combining oxygen with many different substances, rather than the release of phlogiston from those substances.

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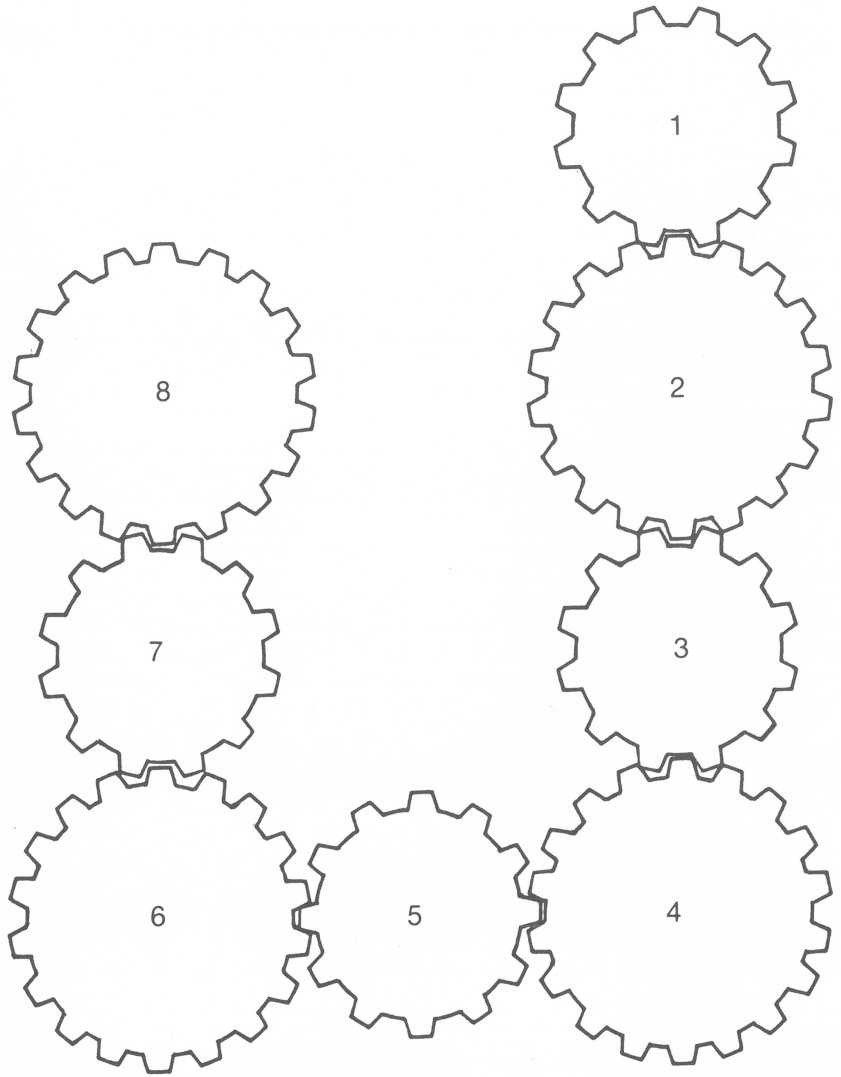

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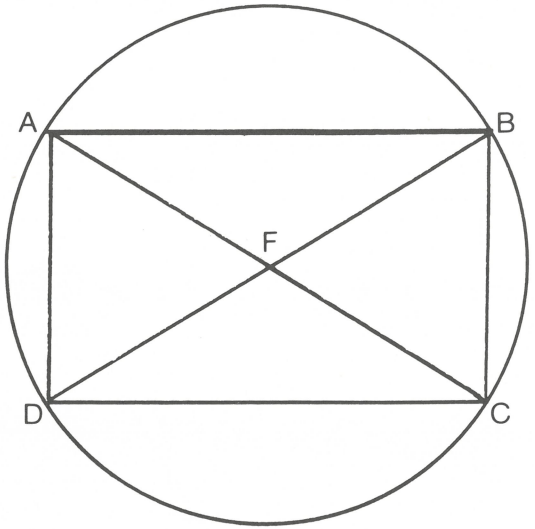

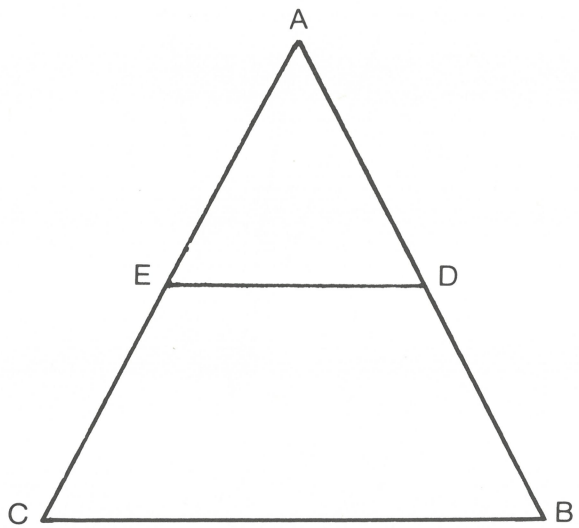

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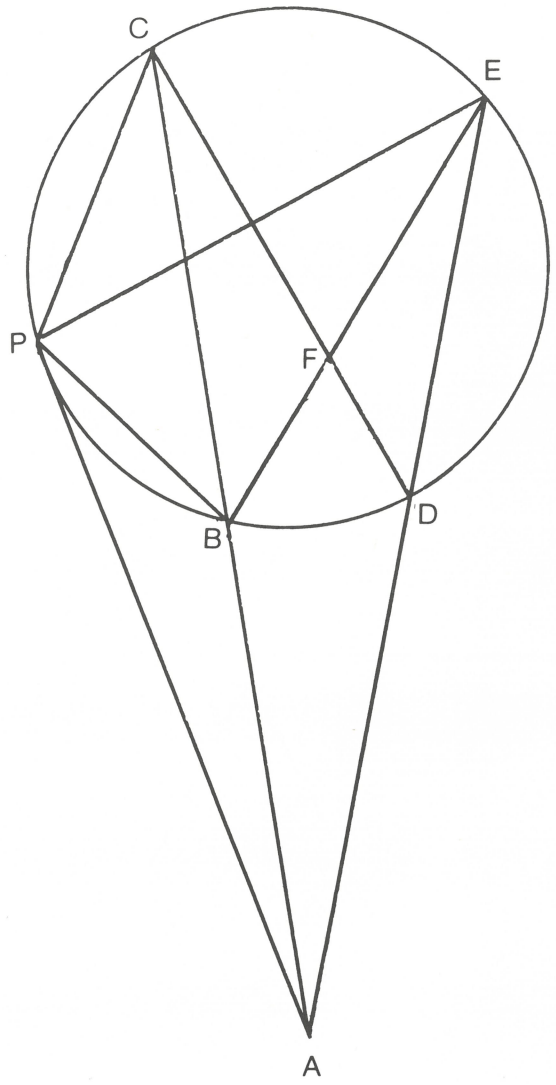

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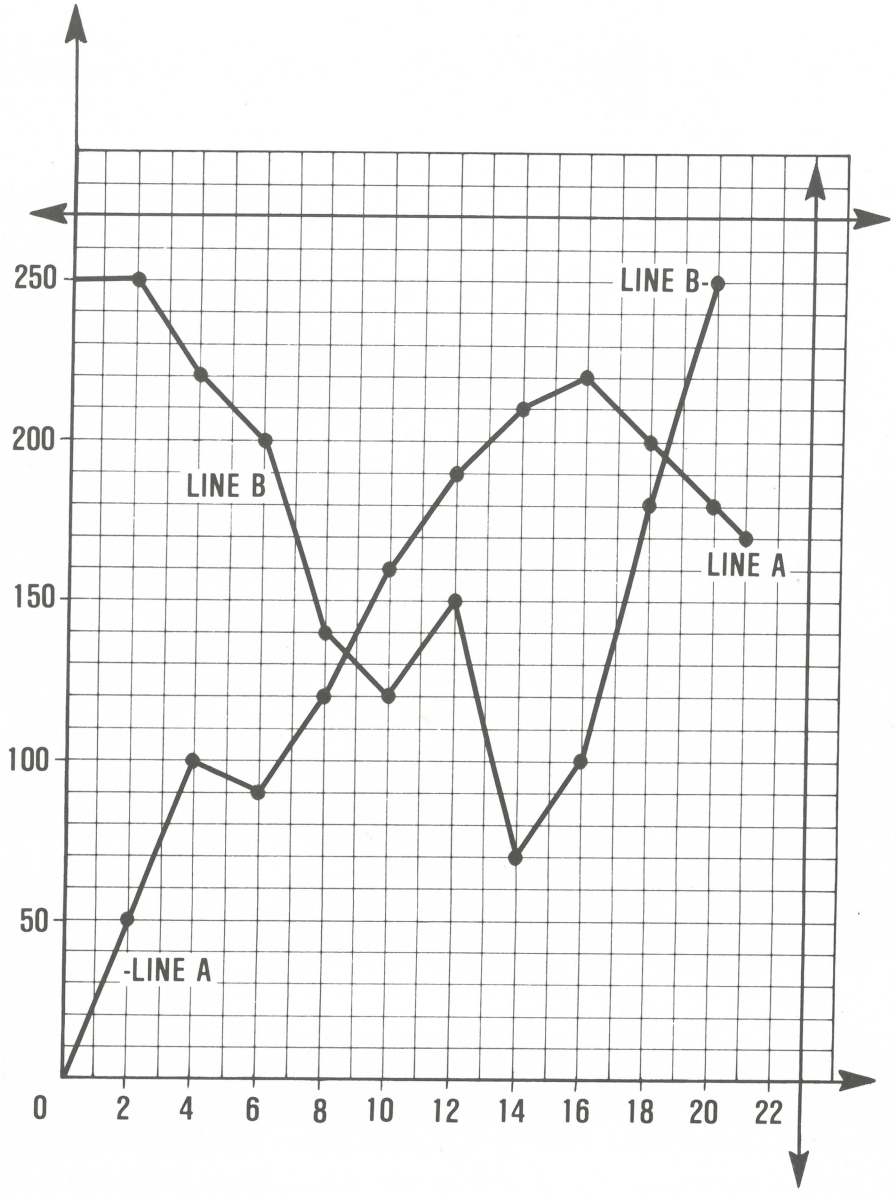

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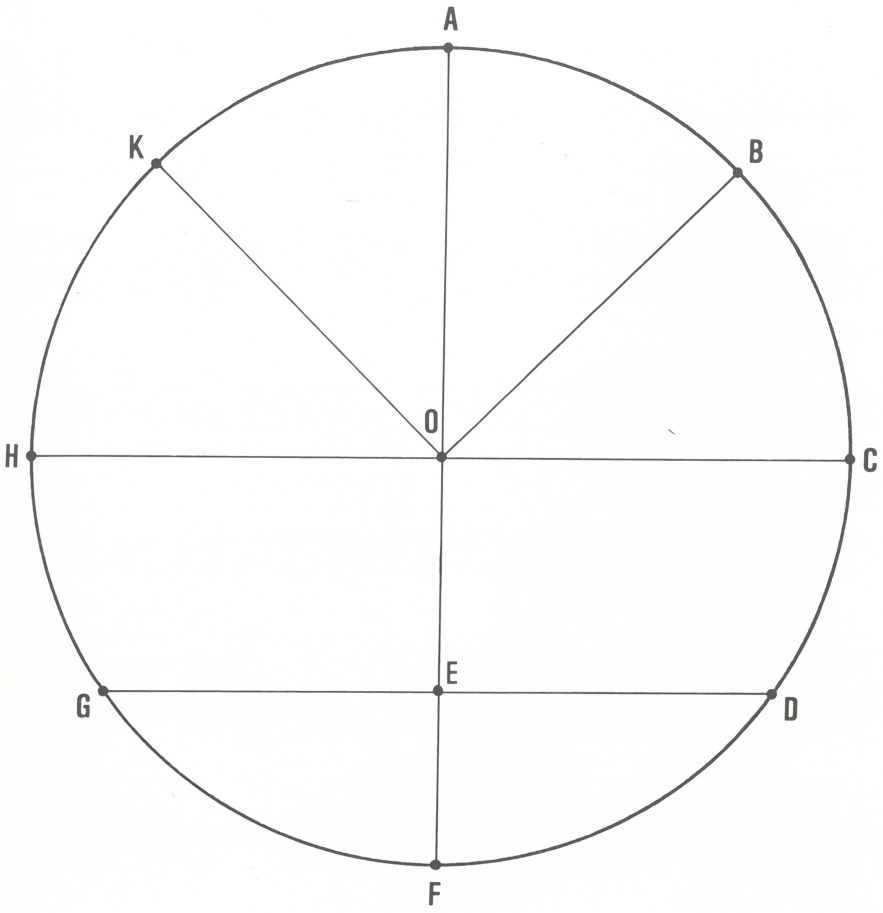

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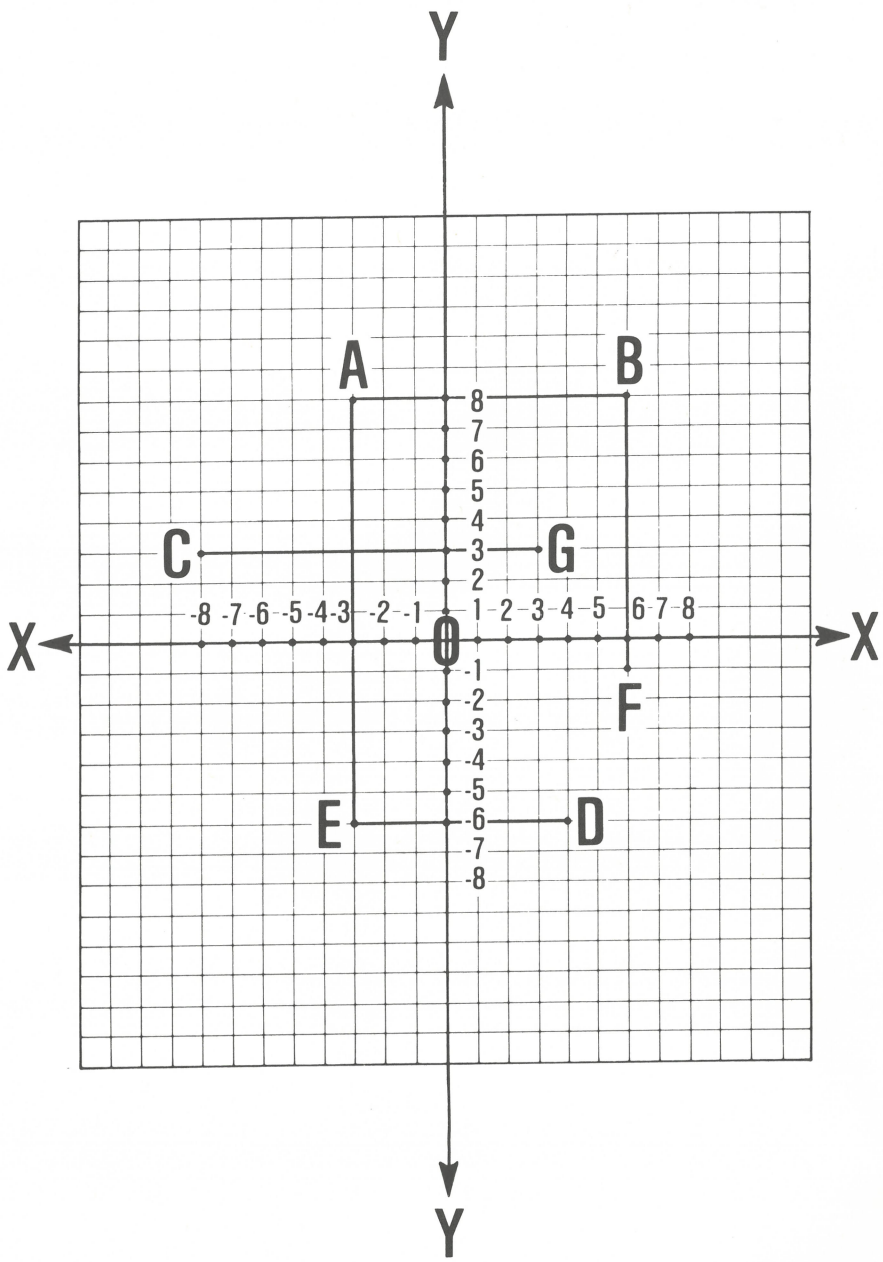

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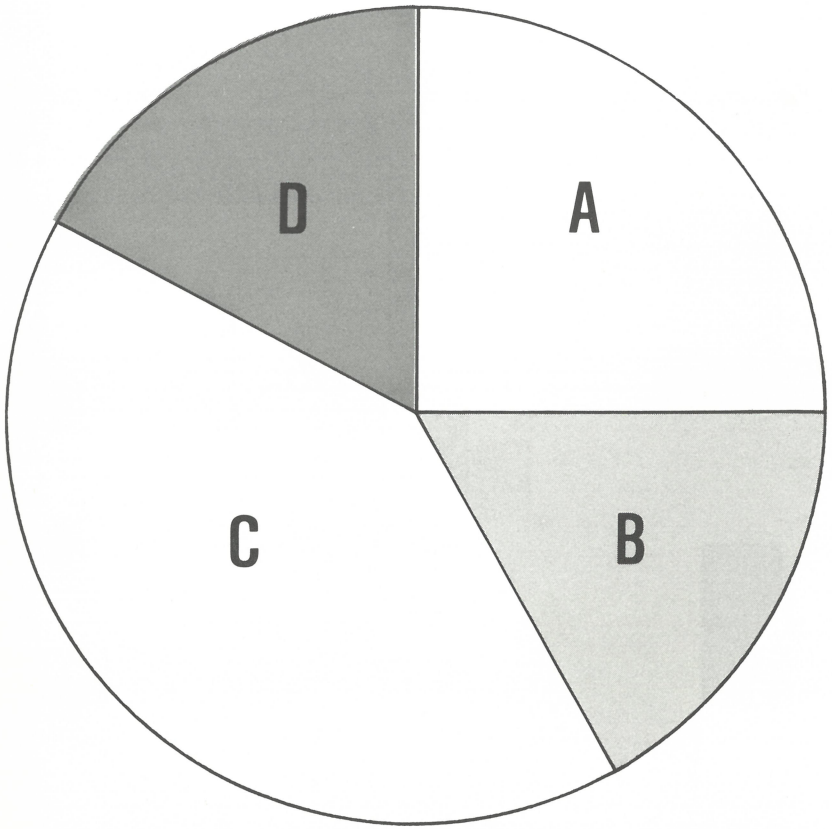

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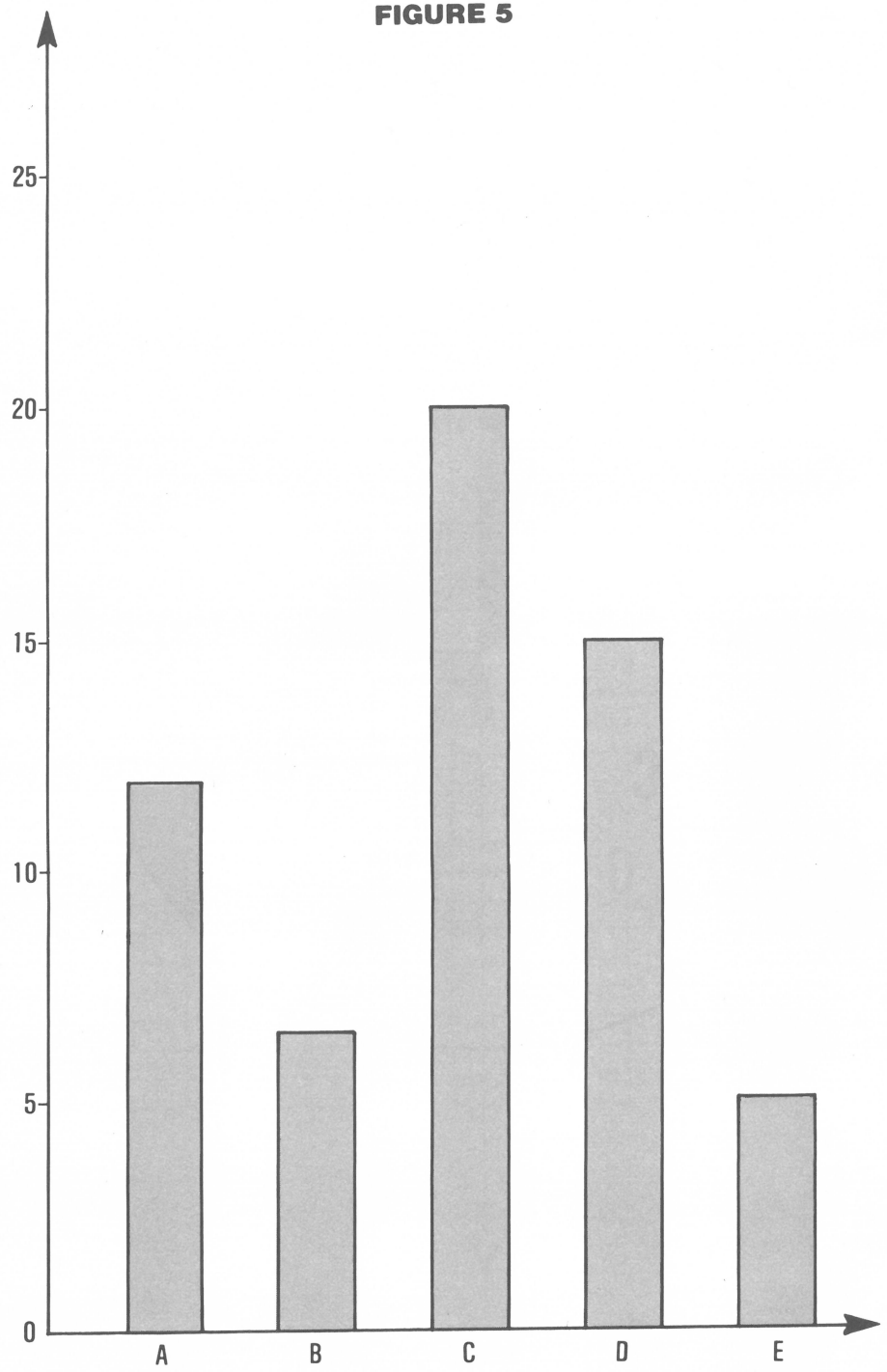

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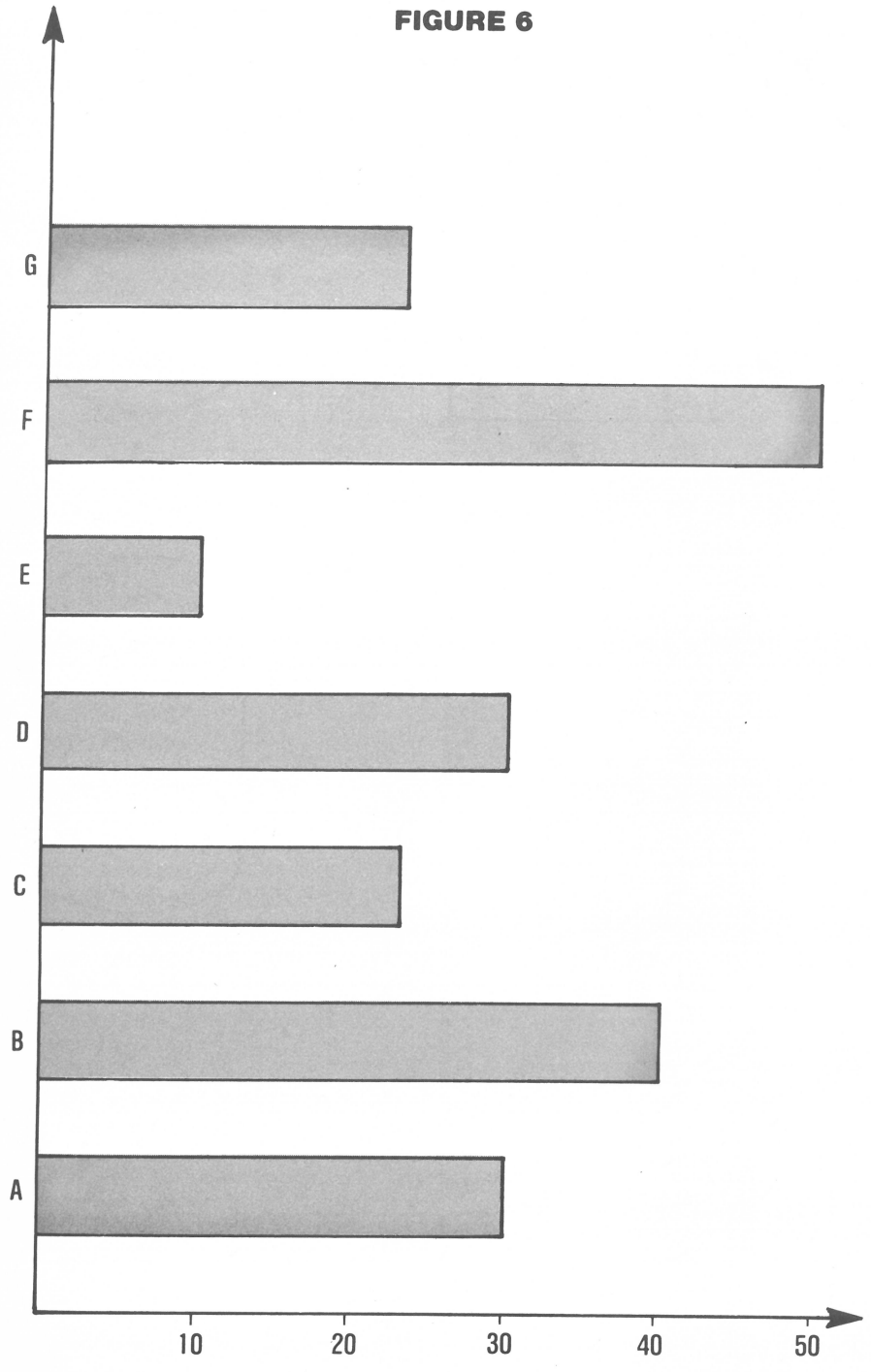

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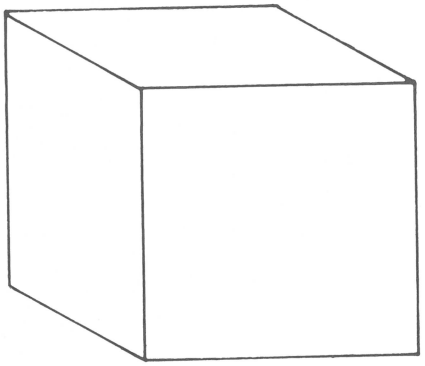

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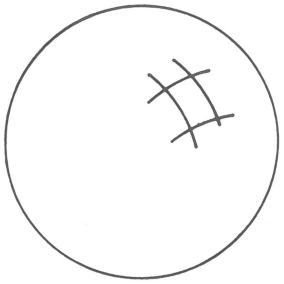

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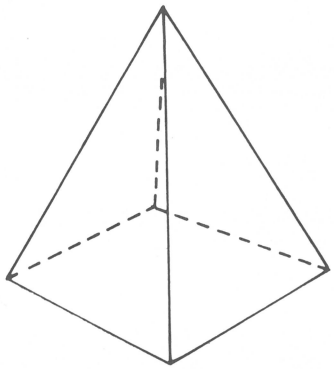

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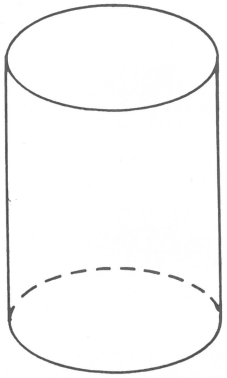

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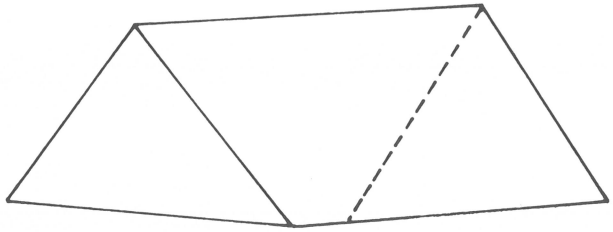

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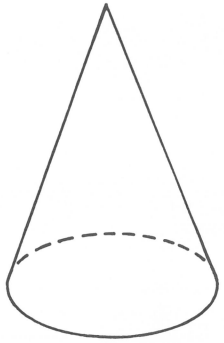

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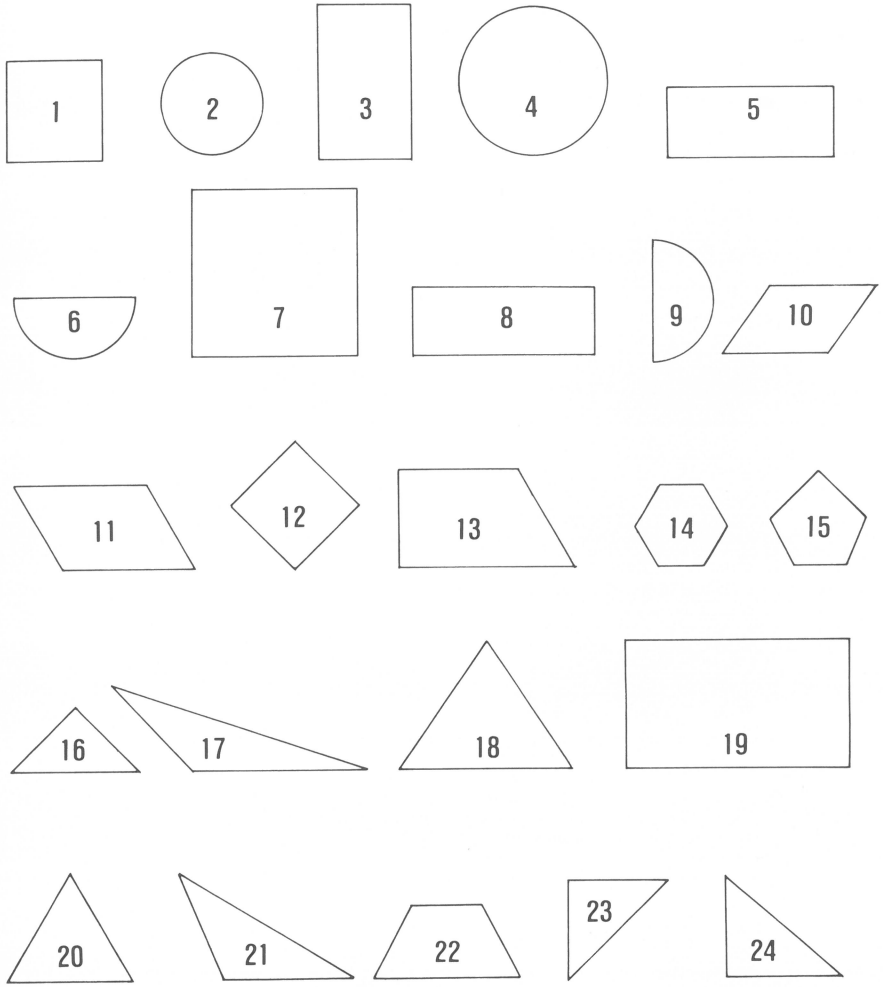
FIGURE 8



APPENDIX

This appendix is designed to illustrate the contents of each of the programs in Krell's ACT Preparation Series. Since virtually all of the programs contain randomization features, this illustrative guide is able to portray only a minute fraction of the actual range of problems and study materials accessible to each student. Nonetheless, we believe it may serve as a valuable source of information on the general structure of problem types with which Krell's Preparation Series and the ACT Exam are concerned.

1

Which word or word pair may best be used in this sentence?

Mary's parents were _____ by her fiance's _____ behavior.

A- Repelled—Seraphic
B- Antagonized—Surly
C- Antagonized—Inviolable
D- Deferred—Benign
E- Dismayed—Irascible

Your Answer?

2

Which word or word pair may best be used in this sentence?

Curiously, Mary's parents were aroused by her fiance's _____ behavior.

F- Effete
G- Abstruse
H- Intrepid
J- Scurrilous
K- Perplexing

Your Answer?

3

Which word or word pair may best be used in this sentence?

Surely, Mary's parents were not _____ by her fiance's _____ behavior.

A- Despised—Abundant
B- Dismayed—Bawdy
C- Imputed—Churlish
D- Devasted—Humane
E- Expatiated—Erratic

Your Answer?

4

Which word or word pair may best be used in this sentence?

Surely, most of the crowd commended the speaker's _____ style.

F- Covert
G- Disparate
H- Fractious
J- Salutary
K- Lackadaisical

Your Answer?

5

Which word or word pair may best be used in this sentence?

Most of the crowd _____ the speaker's churlish style.

A- Extricated
B- Presaged
C- Aggrieved
D- Ridiculed
E- Aggravated

Your Answer?

6

Which word or word pair may best be used in this sentence?

Understandably, because it was _____, the work was not denigrated by the critics.

F- Innate
G- Resplendent
H- Effete
J- Fervent
K- Morbid

Your Answer?

7

Which word or word pair may best be used in this sentence?

Naturally, because it was frank, the work was _____ by the critics.

A- Disliked
B- Aroused
C- Estranged
D- Extolled
E- Arrogated

Your Answer?

8

Which word or word pair may best be used in this sentence?

Curiously, Mary's parents were not _____ by her fiance's _____ behavior.

F- Resuscitated—Doleful
G- Stupified—Spirited
H- Vexed—Benign
J- Perturbed—Parsimonious
K- Antagonized—Capacious

Your Answer?

9

Which word or word pair may best be used in this sentence?

Obviously, his _____ behavior was abhored by all.

A- Lugubrious
B- Indefatigable
C- Enigmatic
D- Halcyon
E- Gregarious

Your Answer?

10

Which word or word pair may best be used in this sentence?

Understandably, because it was effervescent, the work was not _____ by the critics.

F- Divested
G- Allayed
H- Spurned
J- Mollified
K- Expatiated

Your Answer?

SAMPLE WORK SHEET #1

This program is designed to help you improve your skill on the word relation questions posed by ACT. Scoring is based on a system of:

1 point for each correct answer.
0 points for each unanswered question.
0 points for each wrong answer.

Remember that the ACT exams seek the most simple and direct relationships.

1

Which pair of words most nearly bear the same relationship to each other as-

Aviator: Radio

A- Turpitude : Righteous
B- Painter : Brush
C- Percolator : Coffee
D- Element : Hydrogen
E- Statue : Chisel

2

Which pair of words most nearly bear the same relationship to each other as-

Relieve : Assuage

A- Pottery : Wheel
B- Responsibility : Derelict
C- Population : Demographer
D- Terminal : Nascent
E- Cajole : Coax

3

Which pair of words most nearly bear the same relationship to each other as-

Linguist : Language

A- Intrepid : Dauntless
B- Amoeba : Organism
C- Paleontologist : Fossils
D- Temerity : Audacity
E- Tribolites : Fossils

4

Which pair of words most nearly bear the same relationship to each other as-

Reserved : Audacity

F- Fickle : Fidelity
G- Cookies : Baking
H- Publicity : Conspirator
J- Asservate : Maintain
K- Printing : Books

5

Which pair of words most nearly bear the same relationship to each other as-

Resolve : Pliant

A- Drawing : Wire
B- Crucible : Gold
C- Fear : Dauntless
D- Psychologist : Behavior
E- Gales : Meteorologist

6

Which pair of words most nearly bear the same relationship to each other as-

Doctor : Stethoscope

F- Lepidopterist : Net
G- Gold : Refining
H- Dermatologist : Skin
J- Saw : Cabinets
K- Butterflies : Monarch

7

Which pair of words most nearly bear the same relationship to each other as-

Faults : Seismologist

A- Horticulturist : Flora
B- Lewdness : Prude
C- Sagacity : Wisdom
D- Phobia : Psychologist
E- Refining : Gold

8

Which pair of words most nearly bear the same relationship to each other as-

Geologist : Mica

F- Society : Recluse
G- Ophthalmologist : Retina
H- Veracity : Mendacity
J- Mica : Minerals
K- Jurist : Laws

9

Which pair of words most nearly bear the same relationship to each other as-

Pen : Poem

A- Insidious : Pernicious
B- Shovel : Archeologist
C- Vat : Wine
D- Coax : Cajole
E- Nutritionist : Food

10

Which pair of words most nearly bear the same relationship to each other as-

Icthyologist : Carp

F- Ignorant : Knowledge
G- Horticulturist : Flora
H- Indolent : Sedulous
J- Environmentalist : Pollution
K- Paleontologist : Tribolite

SAMPLE WORK SHEET #2

This program is designed to help you improve your skill on the vocabulary questions posed by the ACT.

Scoring is based on a system of:

1 point for each correct answer.
0 points for each correct answer.
0 points for each wrong answer.

Be sure to look up the meaning of words you are unsure of.

1

Which of the words shown below is most nearly opposite in meaning to:

Execrate

A- Gamut
B- Secure
C- Enclave
D- Extol
E- Constrict

Your Answer?

2

Which of the words shown below is most nearly opposite in meaning to:

Destroyed

F- Dotage
G- Opportune
H- Firm
J- Extant
K- Lethargic

Your Answer?

3

Which of the words shown below is most nearly opposite in meaning to:

Lethargic

A- Evince
B- Praise
C- Euphoria
D- Concave
E- Animated

Your Answer?

4

Which of the words shown below is most nearly opposite in meaning to:

Disparage

F- Extol
G- Concave
H- Assiduous
J- Eloquent
K- Curtail

Your Answer?

5

Which of the words shown below is most nearly opposite in meaning to:

Tandem

A- Haggard
B- Praise
C- Estrange
D- Rotund
E- Abreast

Your Answer?

6

Which of the words shown below is most nearly opposite in meaning to:

Inert

F- Inept
G- Antagonize
H- Increase
J- Active
K- Heady

Your Answer?

7

Which of the words shown below is most nearly opposite in meaning to:

Extol

A- Excoriate
B- Inveigle
C- Abreast
D- Adept
E- Constrict

Your Answer?

8

Which of the words shown below is most nearly opposite in meaning to:

Inalienable

F- Transferable
G- Execrate
H- Lax
J- Eminent
K- Diligent

Your Answer?

9

Which of the words shown below is most nearly opposite in meaning to:

Union

A- Abashed
B- Heady
C- Abnegate
D- Dichotomy
E- Laud

Your Answer?

10

Which of the words shown below is most nearly opposite in meaning to:

Emaciated

F- Firm
G- Compliment
H- Immure
J- Bless
K- Plump

Your Answer?

SAMPLE WORK SHEET #3

This program is designed to help you improve your skill on the mathematics questions posed by the ACT. Scoring is as follows:

1 point for each correct answer.
0 points for each unanswered question.
0 points for each wrong answer.

Draw diagrams whenever appropriate. Use pencil and paper for calculations.
The symbol "*" indicates Multiplication.
The symbol "/" indicates Division.

Problem #1:

The coordinates of the center of a square whose sides lie on the X and Y axes are (3,3). What is its area?

A. 60
B. 36
C. 45
D. 40
E. 55

Your Answer?

Problem #2:

What is the diameter of a circle if it is equal in area to a triangle with an altitude of 6PI and a base of 4?

F. Square root of 6
G. Square root of 12
H. Square root of 9
J. Square root of 48
K. Square root of 96

Your Answer?

Problem #3:

Which of the following points is furthest from the point (6,2)?

A. 10,2
B. 4,4
C. 8,0
D. 5,3
E. 8,4

Your Answer?

Problem #4:

Given: Line AB with Midpoint M. The coordinates of A are (12-4) and the coordinates of B are (10,-2). What are the coordinates of M?

F. -3,11
G. 16,12
H. 8,0
J. 11,-3
K. 14,-6

Your Answer?

Problem #5:

What is the diameter of a circle if it is equal in area to a triangle with an altitude of 6PI and a base of 4?

A. Square root of 9PI
B. Square root of 6PI
C. Square root of 48
D. Square root of 96
E. Square root of 12

Your Answer?

Problem #6:

The coordinates of the end points of the diagonal of a square are (6,-4) and (10,6). What are the coordinates of its center?

F. 2,-14
G. 8,1
H. 10,4
J. 14,16
K. 1,8

Your Answer?

Problem #7:

If the length of the side of a cube is increased by 10 percent, by about what percent does its volume increase?

A. 2
B. 1,000
C. 60
D. 100
E. 33

Your Answer?

Problem #8:

If the length of the side of a cube is increased by 20 percent, by about what percent does its volume increase?

F. 400
G. 8,000
H. 2
J. 72
K. 120

Your Answer?

Problem #9:

If the length of the side of a cube is increased by 10 percent, by about what percent does its area increase?

A. 60
B. 100
C. 21
D. 1
E. 1,000

Your Answer?

Problem #10:

The average age of 7 women is 29. If the youngest is 24, what is the maximum possible age of the oldest?

F. 58
G. 66
H. 59
J. 57
K. 62

Your Answer?

SAMPLE WORK SHEET #4

This program is designed to help you improve your skill on the mathematics questions posed by the ACT. Scoring is as follows:

1 point for each correct answer.
0 points for each unanswered question.
0 points for each wrong answer.

Draw diagrams whenever appropriate. Use pencil and paper for calculations.
The symbol "*" indicates Multiplication.
The symbol "/" indicates Division.

Problem #1:

Two lights flash intermittently at intervals of 45 and 63 seconds respectively. If they both flash at noon, in how many seconds will the next simultaneous flash occur?

A. 315
B. 175
C. 525
D. 14175
E. 2835

Your Answer?

Problem #2:

Three circles are externally tangent. What is the perimeter of the triangle that links their centers if their radii are 9, 2, and 10?

F. 42
G. 11
H. 21
J. 180
K. 13

Your Answer?

Problem #3:

Two lights flash intermittently at intervals of 12 and 20 seconds respectively. If they both flash at noon, in how many seconds will the next simultaneous flash occur?

A. 60
B. 45
C. 90
D. 720
E. 240

Your Answer?

Problem #4:

The surface area of a cube is 864 sq. in. It is cut up into a number of identical cubes - each with a surface area of 24 sq. in. How many cubes are there?

F. 216
G. 36
H. 6
J. 72
K. 64

Your Answer?

Problem #5:

Three circles are externally tangent. What is the perimeter of the triangle that links their centers if their radii are 2, 10, and 1?

A. 26
B. 12
c. 13
C. 13
D. 20
E. 4

Your Answer?

Problem #6:

How many different numbers in the range 1352 to 1363 yield integers when divided by 5?

F. 1
G. 2
H. 3
J. 4
K. 6

Your Answer?

Problem #7:

How many different numbers in the range 100 to 499 have the digits 3 in them?

A. 157
B. 161
C. 58
D. 136
E. 47

Your Answer?

Problem #8:

A concrete path 3 feet wide surrounds a square plot of grass. If the surface area of the grass equals 64, what is the area of the path?

F. 132
G. 161
H. 73
J. 96
K. 196

Your Answer?

Problem #9:

A concrete path 3 feet wide surrounds a square plot of grass. If the surface area of the grass equals 16, what is the area of the path?

A. 84
B. 161
C. 25
D. 48
E. 100

Your Answer?

Problem #10:

How many different numbers in the range 300 to 699 have the digit 6 in them?

F. 157
G. 161
H. 58
J. 136
K. 46

Your Answer?

SAMPLE WORK SHEET #5

This program is designed to help you improve your skill on the mathematics questions posed by the ACT. Scoring is as follows:

1 point for each correct answer.
0 points for each unanswered question.
0 points for each wrong answer.

Draw diagrams whenever appropriate. Use pencil and paper for calculations.

The symbol "*" indicates Multiplication.
The symbol "/" indicates Division.

Problem #1:

A white plastic cube 3 in. on each side is painted green. It is then sliced into 1 in. cubes. How many of these have 3 sides painted green?

A. 27
B. 6
C. 12
D. 1
E. 8

Your Answer?

Problem #2:

A white plastic cube 6 in. on each side is painted green. It is then sliced into 1 in. cubes. How many of these have 0 sides painted green?

F. 64
G. 48
H. 96
J. 8
K. 216

Your Answer?

Problem #3:

A theater audience is 10 percent male, and 90 percent female. If 10 percent of the males have red hair and 40 percent of the females have red hair, then what percent of the audience has red hair?

A. 25
B. 40
C. 37
D. 10
E. 13

Your Answer?

Problem #4:

At a large party, each guest eats either apple pie, ice cream, or both. If 95 percent have apple pie and 60 percent have ice cream, what percent have ice cream only?

F. 40
G. 5
H. 55
J. 77
K. 35

Your Answer?

Problem #5:

A large fuel tank is 7/8 full. After 10 gallons are added, it is 8/9 full. What is its total capacity?

A. 479
B. 684
C. 726
D. 882
E. 720

Your Answer?

Problem #6:

A large fuel tank is 3/4 full. After 15 gallons are added, it is 4/5 full. What is its total capacity?

F. 620
G. 211
H. 777
J. 300
K. 115

Your Answer?

Problem #7:

At a large party, each guest eats either apple pie, ice cream, or both. If 70 percent have apple pie and 80 percent have ice cream, what percent have ice cream only?

A. 75
B. 50
C. 10
D. 30
E. 20

Your Answer?

Problem #8:

A boy goes to the post office and spends exactly 4 dollars on 2 cent stamps and 7 cents stamps. What is the greatest number of 7 cent stamps he could have purchased?

F. 57
G. 51
H. 52
J. 55
K. 56

Your Answer?

Problem #9:

X*X - Y*Y = 60

X + Y = 15

X - Y = ?

A. 15
B. 36
C. 4
D. 1
E. 3

Your Answer?

Problem #10:

At a large party, each guest eats either apple pie, ice cream, or both. If 55 percent have apple pie and 75 percent have ice cream, what percent have both?

F. 25
G. 30
H. 45
J. 65
K. 20

Your Answer?

SAMPLE WORK SHEET #6

This program is designed to help you improve your skill on the mathematics questions posed by the ACT. Scoring is as follows:

1 point for each correct answer.
0 points for each unanswered question.
0 points for each wrong answer.

Draw diagrams whenever appropriate. Use pencil and paper for calculations.

The symbol "*" indicates Multiplication.
The symbol "/" indicates Division.

Problem #1:

A man makes a round trip between two cities 270 miles apart. If the trip takes 7 hours going and 8 hours returning, then what is the average speed for the entire trip?

A. 18
B. 38
C. 30
D. 35
E. 36

Your Answer?

Problem #2:

A merchant sells mixed nuts. He buys cashews for 20 cents per pound and almonds for 30 cents per pound, and he mixes them in a ratio of 2:4. How many cents/lb. should he charge for the mixture in order to make a profit of 50 percent of the selling price (to the nearest cent)?

F. 50
G. 53
H. 40
J. 37
K. 64

Your Answer?

Problem #3:

If 3X/5 = 11/15 then 15X/11 =?

A. 5/11
B. 3/3
C. 15/5
D. 5/3
E. 6/5

Your Answer?

Problem #4:

14/49 = X/56

What is the value of X?

F. 22
G. 27
H. 30
J. 26
K. 16

Your Answer?

Problem #5:

Which of these numbers is closest in value to 1/2?

A. 7/7
B. 6/5
C. 9/13
D. 4/9
E. 9/11

Your Answer?

Problem #6:

A helicopter takes off and flies due north 8 miles. Then it flies 13 miles due East. Next it flies 13 miles North. How far, to the nearest mile, is it from its take-off point?

F. 25
G. 23
H. 29
J. 33
K. 34

Your Answer?

Problem #7:

A helicopter takes off and flies due North 10 miles. Then it flies 11 miles due East. Next if flies 11 miles North. How far, to the nearest mile, is it from its take-off point?

A. 28
B. 24
C. 20
D. 32
E. 22

Your Answer?

Problem #8:

A straight fence is 210 feet long. How many fence posts are needed to support it if posts are required at 10 foot intervals?

F. 7
G. 22
H. 63
J. 64
K. 21

Your Answer?

Problem #9:

A boy has a collection of red, white, and blue marbles. These are in the ratio of 5:9:14 respectively. If he has 25 red marbles, how many white marbles does he have?

A. 104
B. 71
C. 140
D. 45
E. 70

Your Answer?

Problem #10:

A straight fence is 130 yards long. How many fence posts are needed to support it if posts are required at 10 foot intervals?

F. 14
G. 13
H. 39
J. 40
K. 5

Your Answer?

SAMPLE WORK SHEET #7

This program is designed to help you improve your skill on the mathematics questions posed by the ACT. Scoring is as follows:

1 point for each correct answer.
0 points for each unanswered question.
0 points for each wrong answer.
Draw diagrams whenever appropriate. Use pencil and paper for calculations.
The symbol "*" indicates Multiplication.
The symbol "/" indicates Division.

Problem #1:

The angles of an isosceles triangle are: A, B, and 2A (B<2A). How many degrees are there in each base angle of the triangle?

A. 68
B. 60
C. 45
D. 90
E. 72

Your Answer?

Problem #2:

The angles of an isosceles triangle are: A,B, and 4A (B<2A). How many degrees are there in the vertex angle of the triangle?

F. 60
G.108
H. 36
J. 62
K. 32

Your Answer?

Problem #3:

The angles of an isosceles triangle are: A,B, and 4A (B<2A). How many degrees are there in the vertex angle of the triangle?

A. 60
B. 30
C. 20
D. 42
E. 120

Your Answer?

Problem #4:

If the product of 3 consecutive numbers is 504, what is the lowest of these numbers?

F. 8
G. 5
H. 7
J. 11
K. 9

Your Answer?

Problem #5:

A manufacturer lowers his price on an item so that his profit per item decreases by 70 per cent. By what percent must the number of items he sells increase if he wants to keep the total profit constant?

A. 233
B. 93
C. 124
D. 566
E. 333

Your Answer?

Problem #6:

A square is inscribed in a circle. A second circle is inscribed in the square.
If the radius of this inscribed circle is 3, what is the area between the square and the inner circle?

F. 9(PI-4)
G. 3(4-PI)
H. 9(4-PI)
J. 9PI
K. 9(2PI-4)

Your Answer?

Problem #7:

N/3 + N/5 = 5
What is the value of N?

A. 90/8
B. 75/8
C. 8/15
D. 85/8
E. 40/15

Your Answer?

Problem #8:

If each box of potato chips contains between 50 and 63 chips, what is the minimum number of chips contained in 70 boxes?

F. 4410
G. 3813
H. 3657
J. 4168
K. 3500

Your Answer?

Problem #9:

1/2 - 1/3 + 1/4 =

A. 1/24
B. 3/9
C. 10/24
D. 10/9
E. 9/24

Your Answer?

Problem #10:

A square is inscribed in a circle. A second circle is inscribed in the square.
If the radius of this inscribed circle is 9, what is the area between the square and the outer circle?

F. 81 (4-PI)
G. 81(2PI-4)
H. 81(PI-4)
J. 9(4-PI)
K. 81PI

Your Answer?

SAMPLE WORK SHEET #8

This program is designed to help you improve your skill on the mathematics questions posed by the ACT. Scoring is as follows:
1 point for each correct answer.
0 points for each unanswered question.
0 points for each wrong answer.

Draw diagrams whenever appropriate. Use pencil and paper for calculations.

The symbol "*" indicates Multiplication.
The symbol "/" indicates Division.

Problem #1:

In a rectangle of length G width L, both length and width are increased by D.

What is the increase in area?

A. GD+LD+DD+GL
B. DD
C. GD+LD+DD
D. (G+D) (L+D)
E. 2(D+D)

Your Answer?

Problem #2:

A train travels between two cities Y miles apart in X hours. The train arrives T hours late.

What rate of speed would have allowed it to arrive on time?

F. X-T
G. Y/(X-T)
H. T-Y/X
J. YX-T
K. Y/X-T

Your Answer?

Problem #3:

A merchant buys an item for D. She wants to sell the item for B, but she wants to offer the customers a discount of N percent, and still make K percent profit on her investment.

How much should she charge for the item (what is the value of B)?

A. D(1+K)/(1+N)
B. D/(1-N/100)
C. D(1-K)/(1+N)
D. D(1-K/100)/(1+N/100)
E. D(1+K/100)/(1-N/100)

Your Answer?

Problem #4:

By how much does 4/(L-D) exceed 6/(D-L)?

F. 10
G. -2/(L-D)
H. 2/(D-L)
J. 10/(L-D)
K. 10/(D-L)

Your Answer?

Problem #5:

A woman makes a round trip between 2 cities D miles apart.

Going there, she averages X MPH. Returning, she averages H MPH. What is her average speed for the entire trip in MPH?

A. 2HX/(H+X)
B. 2(H+X)/HX
C. (H+X)/HX
D. HX/(H+X)
E. (H+X)/2

Your Answer?

Problem #6:

A man buys Z dozen pencils for D dollars per dozen, and sells them for D cents each. If he sells a total of W pencils, what is his total profit, in dollars?

F. WD/100-DZ
G. 12ZD/100
H. WD-DZ
J. Z(D-D)/100
K. WD/100-D

Your Answer?

Problem #7:

What is the value of 1/Y + 1/E?

A. EY/(E + Y)
B. (E + Y)/EY
C. 2EY/(E + Y)
D. 2(E + Y)/EY
E. (E + Y)/2

Your Answer?

Problem #8:

What is the value of 1/N + 1/G?

F. GN/(G+N)
G. (G+N)/2
H. 2GN/(G+N)
J. (G+N)/GN
K. 2(G+N)/GN

Your Answer?

Problem #9:

In a rectangle of length D and width G, both length and width are increased by G.

What is the increase in area?

A. GG
B. (D+G) (G+G)
C. DG+GG+GG
D. 2(G+G)
E. G+GG+GG+DG

Your Answer?

Problem #10:

By how much does 3/(Y-B) exceed 5/(B-Y)?

F. 8/(B-Y)
G. -2/(Y-B)
H. 2/(B-Y)
J. 8
K. 8/(Y-B)

Your Answer?

SAMPLE WORK SHEET #9

This program is designed to help you improve your skill on the mathematics questions posed by the ACT Scoring is as follows:

4 Points for each correct answer.
0 Points for each unanswered question.
0 Points for each wrong answer.

Draw diagrams whenever appropriate.
Use pencil and paper for calculations.
The symbol "*" indicates Multiplication.
The symbol "/" indicates Division.

Remember: Prime numbers are those divisible only by themselves and 1. This program poses questions slightly more difficult than those used on the S.A.T. exams, however, we believe it to be extremely valuable for review.

All of the problems in this section are based upon the same diagram. Draw the diagram according to the description that follows.

Given a circle "O" and a point "A" outside the circle. A tangent to the circle is drawn from point "A" which meets the circle at point "P".

Also from point "A", two secants are drawn:
Secant "ABC" intercepts the circle first at point "B" then at point "C".
Secant "ADE" intercepts the circle first at point "D" then at point "E".

Next, five chords are drawn:
"BE", "CD", "PB", "PC", and "PE".

Finally, the intersection of "BE" and "CD" is labeled point "F".

Problem #1

Which of these statements is only sometimes true?
I. BA/DA = EB/CD.
II. Triangle CFB is similar to Triangle FED.
III. ARC BD > ARC CE

A- None
B- I
C- II
D- I & III
E- II & III

Your Answer?

Problem #2

Which of these statements is never true?
I. AP/AB = AC/AP
II. AP/AD = AE/AP
III. Angle PBA > Angle BPC + Angle BCP

F. None
G- II
H- I & II
J- III
K- II & III

Your Answer?

Problem #3

Which of these statements is always true?
I. Angle PBC < Angle APB + Angle BAP
II. Angle FDA = Angle DEF + Angle EFD
III. Angle CPA < Angle PBA

A- None
B- II
C- III
D- I & III
E- I, II & III

Your Answer?

Problem #4

Which of these statements is never true?
I. BC is a diameter
II. PC is a diameter
III. Angle BFC and Angle BFD are complementary.

F- None
G- I & II
H- III
J- I & III
K- II & III

Your Answer?

Problem #5

Which of these statements is always true?
I. Angle BFC and Angle BFD are supplementary
II. Angle BEA is less than one half ARC PD
III. Angle BEA = ½ ARC PB

A- I
B- I & II
C- III
D- I & III
E- II & III

Your Answer?

Problem #6

Which of these statements is never true?
I. Angle DCA < Angle CDA
II. Angle DCA = Angle EBA
III. Angle DCA < Angle BFD

F- None
G- I
H- II
J- II & III
K- I, II & III

Your Answer?

Problem #7

Which of these statements is always true?
I. Angle DCA < 90 degrees
II. Angle DCA < Angle BAE + Angle BEA
III. Angle DCA < Angle BCF + Angle BAD

A- I
B- I & II
C- I & III
D- II & III
E- I, II & III

Your Answer?

Problem #8

Which of these statements is only sometimes true?
I. ARC DE < APC CPB
II. Triangle EBA is similar to triangle ACD
III. EB/CD = AE/AC

F- None
G- I
H- III
J- I & III
K- II & III

Your Answer?

Problem #9

Which of these statements is always true?
I. EB*AC = AE*CD
II. Angle BAD = Angle BPA
III. Angle BAD > Angle BFD

A- I
B- II
C- I & II
D- III
E- I & III

Your Answer?

Problem #10

Which of these statements is only sometimes true?
I. Angle BAD > Angle CFE
II. Angle BAD = Angle CFE
III. Angle PAD > Angle BAD

F- None
G- I
H- II
J- I & II
K- I, II & III

Your Answer?

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